UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS

International General Certificate of Secondary Education

MARK SCHEME for the October/November 2010 question paper for the guidance of teachers

0654 CO-ORDINATED SCIENCES

0654/63 Paper 6 (Alternative to Practical), maximum raw mark 60

This mark scheme is published as an aid to teachers and candidates, to indicate the requirements of the examination. It shows the basis on which Examiners were instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners' meeting before marking began, which would have considered the acceptability of alternative answers.

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1 **(a)** tube **A** 41 °C ;
tube **B** 32 °C ;

(b) **(i)** tube **A** 14 °C
tube **B** 23 °C
tube **C** 12 °C
tube **D** 17 °C
(4 correct temperatures 2 marks, 3 correct 1 mark) [2]

(ii) tube **A** 2.8 °C / min
tube **B** 4.6 °C / min
tube **C** 2.4 °C / min
tube **D** 3.4 °C / min
(4 correct averages 2 marks, 3 correct 1 mark) [2]

(c) **(i)** heat (energy) transferred to / used by cold test-tubes / owtte ; [1]

(ii) control / to see what would happen with no covering ; [1]

(d) sweating speeds up heat loss (ora) / cools down quicker ;
(heat transferred to water) by conduction / evaporation ; [2]

[Total: 10]

2 **(a)** **(i)** magnet ; [1]

(ii) (labelled diagram)
funnel and paper ;
at least two labels ; [2]

(iii) evaporate (<u>not</u> to dryness) (to concentrate) ;
leave to dry / dab dry with filter paper / dessicator ; [2]

(b) **(i)** (acidified) barium chloride / barium nitrate (solution) ;
white precipitate / solid (allow ppt) ; [2]

(ii) sodium hydroxide (soln) ;
white ppt, soluble in excess / owtte ; [2]

(c) lead sulfate is insoluble ; [1]

[Total: 10]

3 **(a)** rheostat / variable resistor ;

(b) 0.35, 0.48 ; (+/– 0.1) [

(c) **(i)** scales correct and at least one axis fully labelled ;
points correct ;;
straight line ; [4]

(ii) proportional / linear ; [1]

(d) circuit broken / wire melted / ammeter broken / owtte ; [1]

(e) decreases / goes down ; [1]

[Total: 10]

4 **(a)** change in mass 0.3, 0.1, 0.1, 0.3, 0.5 ; (all)
correct arithmetic sign ; [2]

(b) correct use of +ve and –ve values in plotting ;
correct plotting (allow ecf) ;
line of best fit drawn ; [3]

(c) value of 0.15 M or correct reading from graph ; [1]

(d) **(i)** any **one** suitable, e.g. not all potato exactly same mass / not all water removed for weighing / variation in temperature / variation in potato tissue / surface area different etc. ; [max 1]

(ii) make potato exactly 5.0 g / blot pieces carefully / maintain external temperature ; [max 1]

(e) red cells would burst / solution would become red ;
animal cells do not have a cell wall / plant cells have a cell wall to prevent bursting ; [2]

[Total: 10]

5 **(a)** 375 ;
510 ;

(b) bubbles / effervescence makes it cloudy / test-tube opaque ; [1]

(c) marble (left in the test-tube at end) ; [1]

(d) **(i)** points (all 4 = 2 marks, 3 = 1 mark) ;;
line of best fit (**not** point to point) ; [3]

(ii) 1.15 mol / dm^3 / from students graph ; [1]

(e) line (labelled **T**) below original ; [1]

(f) any sensible answer, e.g. difference in shape or size or mass of marble / difficulty of judging when test-tube is clear ; [max 1]

[Total: 10]

6 **(a)** **(i)** 39.0, 25.5 ; [2]

(ii) 35.0, 23.0 ; [2]

(iii) 4.0, 2.5 (ecf) (**penalise** lack of .0 once **only**) [1]

(b) indication of working on the graph ;
gradient = 0.13 ; [2]

(c) fill container with water ;
immerse dog ;
fill measuring cylinder to known vol. ;
pour displaced water into measuring cylinder ;
remove dog and refill from measuring cylinder ;
record / calculate volume used ; [max 3]

[Total: 10]